

REMARKS

In a separate petition, Applicant has requested that the present application be withdrawn from issue because it had been allowed responsive to the filing of a terminal disclaimer to USP 5,414,259. However, the present application is assigned to Metara, Inc. whereas USP 5,414,259 is assigned to Duquesne University, making the use of a terminal disclaimer improper.

Applicant respectfully traverses the rejection of claims 1 through 24 as being unpatentable over claim 1 of USP 5,414,259 (the '259 patent) in view of the Fassett reference. Given the significant differences between the present claims 1 through 24 and claim 1 of USP 5,414,259, Applicant would like to provide some general background before addressing these rejections. As indicated by the title of '259 patent, this patent discloses a method of speciated isotope dilution mass spectrometry (SIDMS). Applicant has deliberately highlighted the word "speciated" because of the significant differences that lie behind this word and the subject matter of pending claims 1 through 24.

To practice SIDMS, one must spike with an isotope-altered form of the specie(s) one is interested in characterizing. For example, consider Example II starting at Col. 10, line 65 of the '259 patent. In this example, the patentee was interested in characterizing the amounts of Cr(III) and Cr(VI) within a sample. Since the patentee was employing SIDMS, he spiked the sample with known amounts of Cr(III)-50 and Cr(VI)-50. In other words, if one is interested in species "x," in an SIDMS process you must spike with an isotope-enriched form of the species x. After equilibrating the spiked sample, it was subjected to mass spectrometric analysis. As discussed in Col. 16, lines 1-7, a number of mass spectrometric instruments could be used including inductively coupled mass spectrometry (ICP-MS) and thermal ionization mass spectrometry (TIMS). Regardless of the specific instrument used, at the filing

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date of '259 patent (May 9, 1995) the ionization was so harsh that species information is destroyed. For example, as Cr(III) and Cr(VI) pass through an inductively-coupled plasma stage of an ICP-MS instrument, both species are converted to Cr(I). Thus, you must first separate the species such as Cr(III) and Cr(VI) from each other before their characterization in the mass spectrometer. As discussed in the '259 patent, for example, at Col. 13, line 65 through Col. 14, line 13, a number of separation techniques may be employed to separate the species including chromatography. The goal was to physically separate the species before they are introduced into the mass spectrometer. These well-known characteristics of an SIDMS process are reflected in claim 1 of the '259 patent.

Specifically, claim 1 of the '259 patent includes an act of "converting said stable isotope to a speciated enriched isotope corresponding to the species to be measured in said sample." As discussed above, this reflects the speciated nature of SIDMS – you spike with an isotope-enriched form of the species(s) you are analyzing. In addition, claim 1 of the '259 patent includes an act of "separating all said species from said sample ...." As also discussed above, the species need separation before an SIDMS analysis can be completed.

Now contrast these and other elements of claim 1 to those recited in pending claim 1 of the present application. Here, Applicant has claimed an automated isotope dilution mass spectrometry method. In contrast, the SIDMS method disclosed in the '259 patent is a fundamentally offline process, requiring considerable user interaction in regards, for example, to calibration. In even sharper distinction, claim 1 does not require the use of isotope-enriched forms of the species being analyzed. Instead, claim 1 recites the act of "spiking at least one enriched stable isotope of an element or specie related to said sample." This act does not require an isotope-enriched species corresponding to the species being analyzed as required in an SIDMS process such as that disclosed in the '259 patent. Instead, this act includes in its scope the use of isotope-enriched elements as the spike rather than a speciated

enriched isotope as in SIDMS. Because the '259 patent was limited to a disclosure of an SIDMS technique, the Examiner further combined this patent with the Fassett reference, which discloses a thermal ionization mass spectrometric (TIMS) technique. But Fassett also requires a separation step as does the '259 patent. Specifically, on page 644, Fassett discloses an analysis of vanadium in crude oil, wherein after equilibration of the spike, "the vanadium was separated by ion exchange and the isotopic composition determined by TIMS. In sharp contrast, claim 1 needs no separation step because of the act of "subjecting said equilibrated spikes and samples to atmospheric pressure ionization to create ions therefrom."

Advantageously, such an act requires no separation before the ions are introduced into a mass spectrometer, thereby enhancing the automated character of Applicant's invention. Neither the '259 patent nor the Fassett reference, alone or in combination provide any teaching or suggestion for such an advantageous feature. Thus, Applicant respectfully submits that claim 1 is plainly allowable over both the '259 patent and the Fassett reference. Dependent claims 6 and 9 of the '259 patent add nothing further. Indeed, claim 9 of the '259 patent expressly limits the separation step to involve chromatography.

Because claims 2 through 24 depend either directly or indirectly upon claim 1, they are patentable over the claim 1, 6, and 9 of the '259 and the Fassett reference for at least the same reasons.

Applicant gratefully acknowledges the previous indication that claims 25 through 38 are allowable.

### CONCLUSION

For the foregoing reasons, Applicant respectfully submits that pending claims 1 through 38 are in condition for allowance.

If there are any questions regarding any aspect of the application, please call the

undersigned at 949-752-7040.

I hereby certify that this correspondence is facsimile transmitted to the Commissioner for Patents, Alexandria, VA 22313-1450, at (703) 308-6916, on November 18, 2003.

  
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November 18, 2003  
Date of Signature

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